ORMOND COLLEGE FORMAL HALL SEMINAR

Wednesday 9 April 2025

Acknowledgments

Dr Areti Metuamate, Master and Head of College, **Margie Welsford,** Vice Master, **Staff** and **Students,** Ormond College, University of Melbourne

Students of visiting colleges

Distinguished guests

I begin by acknowledging the Traditional Owners of the lands on which this College stands – the Wurundjeri people of the Eastern Kulin Nation – and pay my respects to their Elders, past and present.

It's a pleasure to join you all here this evening.

As someone who has spent a significant amount of time in academia, I'm thrilled to take part in a series that honours the great tradition of oral discussion to share ideas.

I found myself in a career in academia not because I had planned to, but because I actively pursued what I cared about.

Higher education is one of the few opportunities in life where you can wholeheartedly engage in topics that spark your curiosity.

For the most part, you can do this because it matters to you – not because someone else is telling you it should.

In following what is of interest to you – or avoiding what isn't – you will likely make what you do more engaging.

Your education is not only your means to get to that point, but it will become the base for your action later in life.

Whether you are aware of it or not, it becomes the well of knowledge to which you return as you make sense of the world around you, and as you make your own way in it.

In this spirit, I hope to share with you some reflections that you may take with you as you embark upon your respective journeys.

Your series is based around the idea of "deep thought, reflection and sustained effort" – with regard to the realm of research and innovation.

Let me begin this conversation by considering three different ways that great research relies on sustained effort in the face of a multitude obstacles, but also requires time, unencumbered time for thought and conversation.

In the 1970s, Dr. John O'Sullivan, a young Australian electrical engineer working in radio astronomy, faced a daunting task: analysing hundreds of cosmic radio signals to detect distant black holes.

O'Sullivan was sick of the monotony of the work, and as a self-described "inherently lazy" person, he was desperate to figure out a way of speeding up the task.

His solution was a 'Fast Fourier Transform' or 'FFT' computer chip – and, I will have to spare you the technical details.

The essential outcome of this new device was that it dramatically increased his efficiency.

Though he found no black holes, O'Sullivan's invention would, unbeknownst to him at the time, revolutionise our world.

Years later, when Dr John O'Sullivan, Dr Terry Percival, Diet Ostray, Graham Daniels and John Deane sat down together at the CSIRO, they were presented with a problem that many researchers face – a simple concept marred by complications.

The team had two goals:

1. To do away with the ceaselessly growing mess of cords and wires necessary for the internet; and
2. To make it fast, and therefore, usable.

This meeting would be the precursor to something that billions of people now use every single day – Wi-Fi.

At the time, the researchers set a goal of 100 megabits per second, a speed that today is still considered challenging for many contexts.

To speak kindly, it was ambitious – but to reflect the sentiment at the time, it was ludicrous.

This was evidenced by the fact that their target was akin to the highest fibre optic technology available, and wireless technology at the time was capping out at a mere 2 megabits.

However, they had two secret weapons: the FFT chip, and a whole lot of perseverance.

At every turn, they seemed to hit an issue – the concept was too big, then it was too complicated, and then it would take too much power.

Their Wi-Fi signal worked but it acted more like a pinball bouncing around a machine than something omnipresent and reliable.

Despite the setbacks, the team were convinced that it could work.

They experimented, pushing a bulky, television-like receiver on a trolley, with transmitters mounted on the CSIRO roof.

With research and refinement, and over many years, that gargantuan receiver became smaller and smaller, and was eventually reduced to the size of a chip that could fit inside a computer, or a phone.

This breakthrough exemplifies the power of blue-sky research – a term that describes research without a clear goal in mind.

In answering such questions, and when combined with power of sustained effort, thought, and reflection – one may unearth unanticipated discoveries in tangential areas.

It's fitting that we are tonight reflecting on the power of research and innovation within Ormond College.

This institution's foundations rest upon the progressive ideals of the Scottish Enlightenment – which prioritised a fair and open education.

The inclusion of students from many backgrounds, the expansion of practical classes, and a commitment to educational excellence provides the foundation for research at the level and scale that became the default paradigm in the 20th century.

This approach to innovation has now become commonplace throughout our nation.

It's a story reminiscent of Australia at the Olympics: by all accounts, a country the size of Australia should not produce such an impressively sized international education sector, complemented by consistent and brilliant research – yet, we do.

The pursuit of questions that may lead to better understanding is the foundation of blue-sky research, where the focus is on the question itself, rather than an agenda for immediate tangible applications.

Deep thought, reflection and a perseverance of effort amount to little if the object of the research is set to support a pre-determined outcome.

Through an openness and willingness to experiment and learn, we reap the unforeseen benefits.

This principle is evident across the innovation and research sectors, and we see it clearly here in the strength of medical research.

Australia is proudly home to the world's first cervical cancer vaccine – not only its development, but its rollout.

Dr. Jian Zhou and Dr. Ian Frazer weren't setting out to create a vaccine.

Dr. Zhou aimed to understand HPV's mechanisms, while Dr. Frazer studied the immune response to the virus.

After more than a year of experimentation, they felt they were no closer to understanding.

Many of us know that feeling: the at times crippling frustration, of something just out of reach.

Slowly, but surely, they made progress, first through contributions to understanding the virus.

It took another fifteen years of work to arrive at a vaccine – one that now has reached more than 200 million people globally.

Neither of these researchers would have thought that the lion's share of their life's work would be dedicated to this vaccine, but that is where the research took them.

They saw a journey of understanding, rather than a path to a new vaccine.

In what is an increasingly typical story across innovation and research sectors – the vaccine, Gardasil, has found use outside cervical cancer.

One example, concerning direct Gardasil injections, eradicated a 97-year-old woman's extensive leg cancer within 11 months – highlighting the potential for other applications.

Aaron Wildavsky in his book 'Revolt Against the Masses' echoed this sentiment.

Although he was focusing on the bloated nature of how federal budgets are presented, he came to propose an approach called 'radical incrementalism' – to better understand and react to changes.

He describes:

"A basic purpose of radical incrementalism is to facilitate speedy and continuous adaptation to emergent problems…

Demands could be dealt with as they arise. If the latest incremental move suggests a new step requiring changes in appropriations, a decision could be made right then and there."

This approach has applications across a wide range of sectors, notably research:

"Narrowing, fragmenting, and dispersing these budgetary reviews has considerable advantage from the viewpoint of encouraging experimentation and innovation: because no one organization is overburdened, the most thorough analysis is facilitated…"

Whether it's the HPV vaccine or the invention of Wi-Fi – innovative discoveries frequently arise not from giant leaps, but from a series of small, well-considered steps – and reflection on what the journey is telling us.

The benefit of radical incrementalism is born out of its promotion of a determined pursuit of each and every step.

This diligence guides research and innovation towards unexpected and at times, surprising results.

Early in my term as Vice Chancellor and President of RMIT, I had the privilege of learning from 'my' first Chancellor, Professor Dennis Gibson – one of the most significant Vice Chancellors of those remarkable Dawkins years in Australian higher education.

He was the first Vice Chancellor of QUT and founder of the ATN group – a group that recently celebrated its 25th anniversary.

Dennis gave me a novel by J.C. Masterman titled "To Teach the Senators Wisdom".

This wry and perceptive unpacking of what made Oxford University great (written in the 1950s) resonates today, because it was addressing some of these fundamental questions that continue to be and should be central to the future of universities.
Masterman comments:

"… [that every year when the new class arrives] …the great age dawns for them and the golden years begin.

We're here to help them if we can, not to impose our standards and our views and our rules of conduct upon them…. [F]or each individual it is a different secret – and each must find it for himself [sic]"

Masterman's insights remind us that true innovation isn't about imposing answers, but about fostering an environment where individuals can discover their own paths to understanding.

His view that universities should nurture individual discovery echoes Ormond College's foundational belief in fostering independent thought.

Regardless of your career path or the sector you work in, there is always something new to learn or observe.

It is not just the knowledge that you absorb here that will serve you, but, more importantly, the approach to seeking out new things that will benefit your future selves.

That sentiment is true regardless of your path – whether it be in electrical engineering, vaccine development, or budgetary measures, or any of the number of possibilities you might pursue with your education.

As long as you follow what is of interest to you, you will remain engaged; and as long as you remain open-minded, you will be poised to seize the opportunities that present themselves – even if they are unexpected.

In that respect, the approach to research and innovation is no different from any other pursuit in life.

Thank you.